20nTTO" 89E4hOT

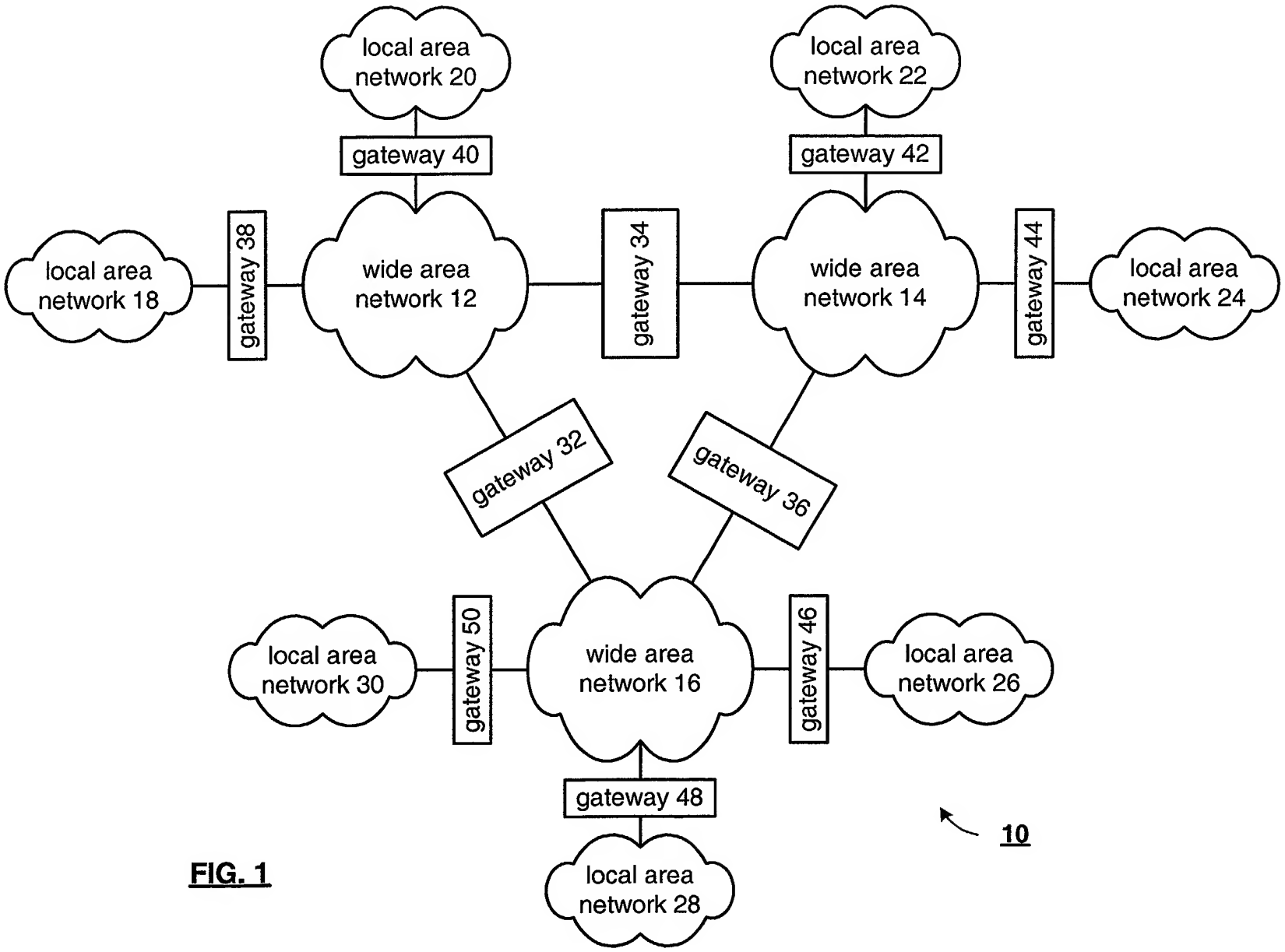


FIG. 1

20hTTO" 89Z4hO0Z

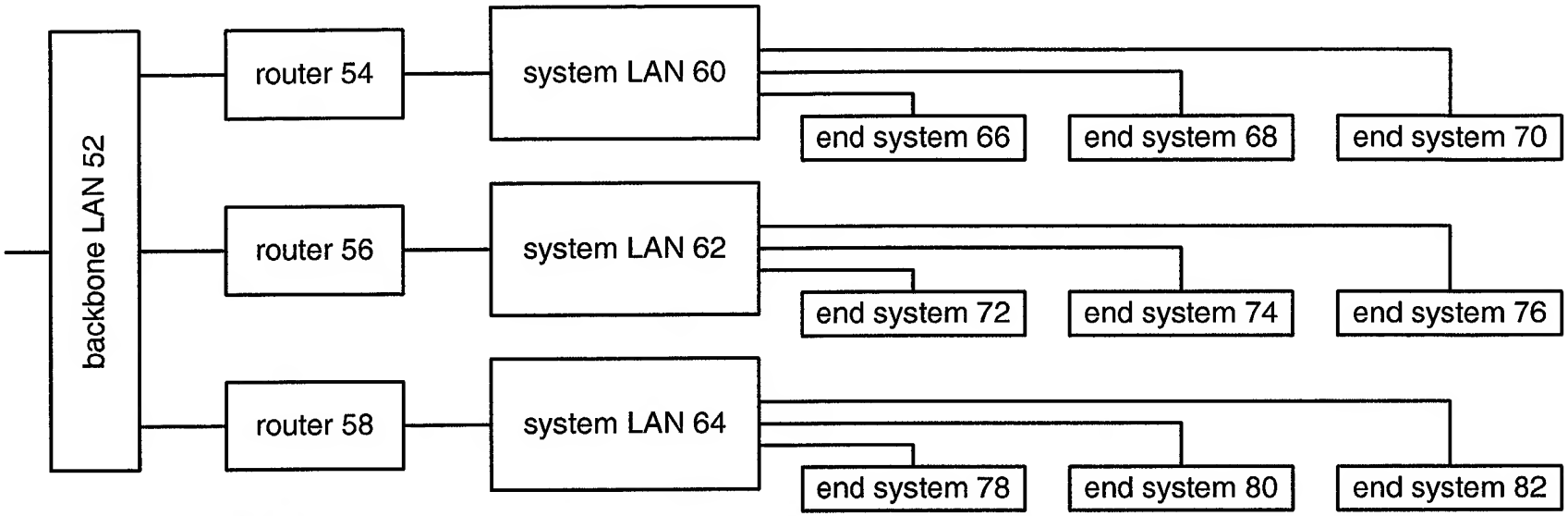


FIG. 2 **LAN 18 - 30**

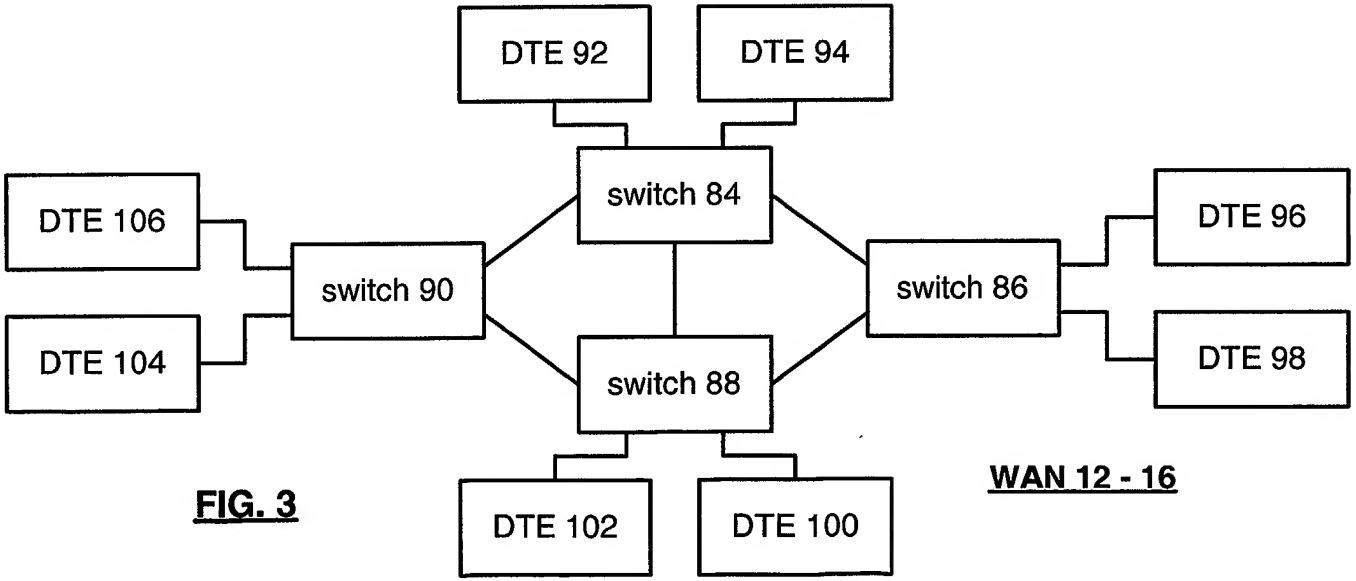


FIG. 3 **WAN 12 - 16**

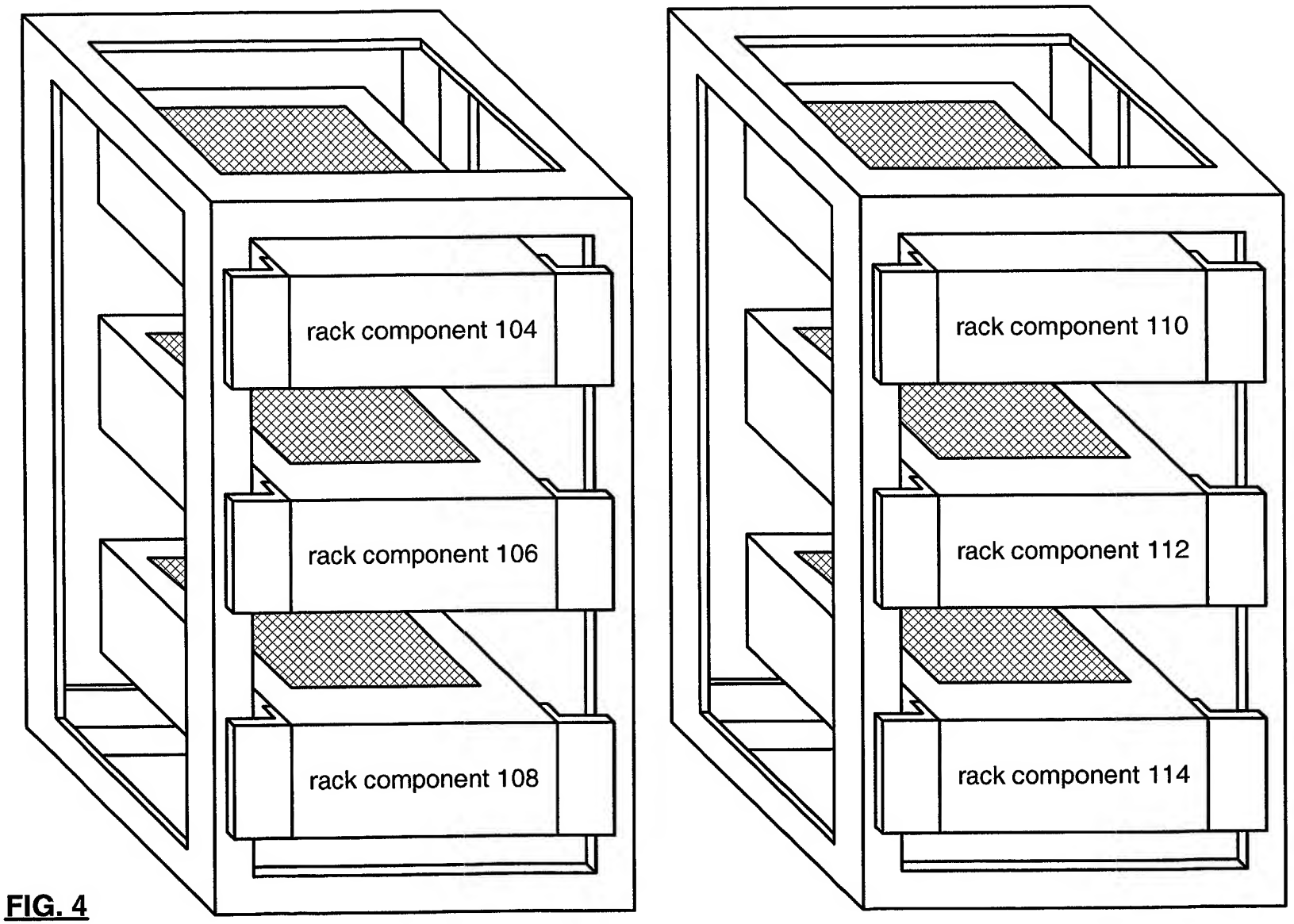

rack component 104
rack component 106
rack component 108
rack component 110
rack component 112
rack component 114

FIG. 4

20hTTO' 89E4h0OT

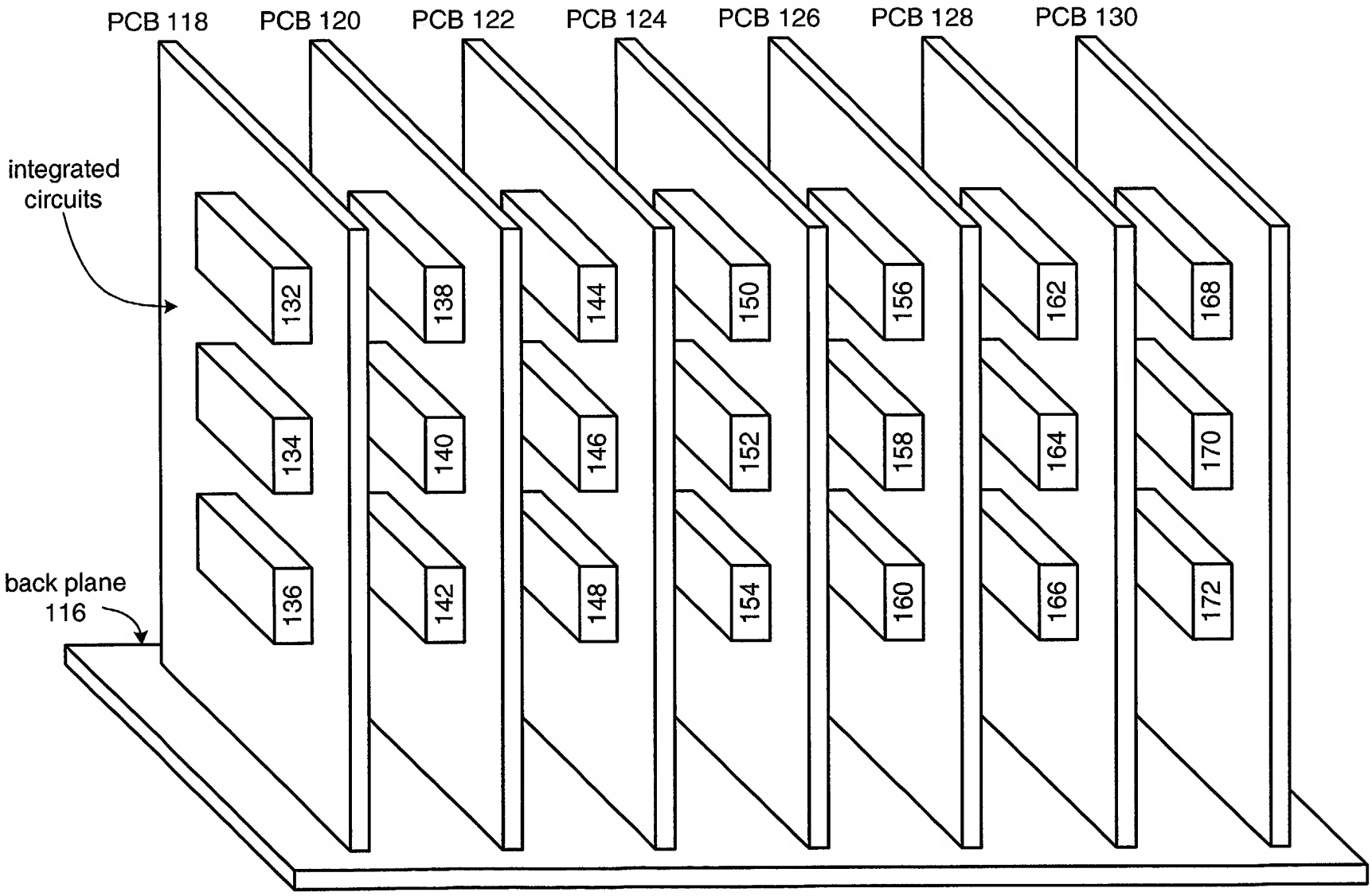


FIG. 5

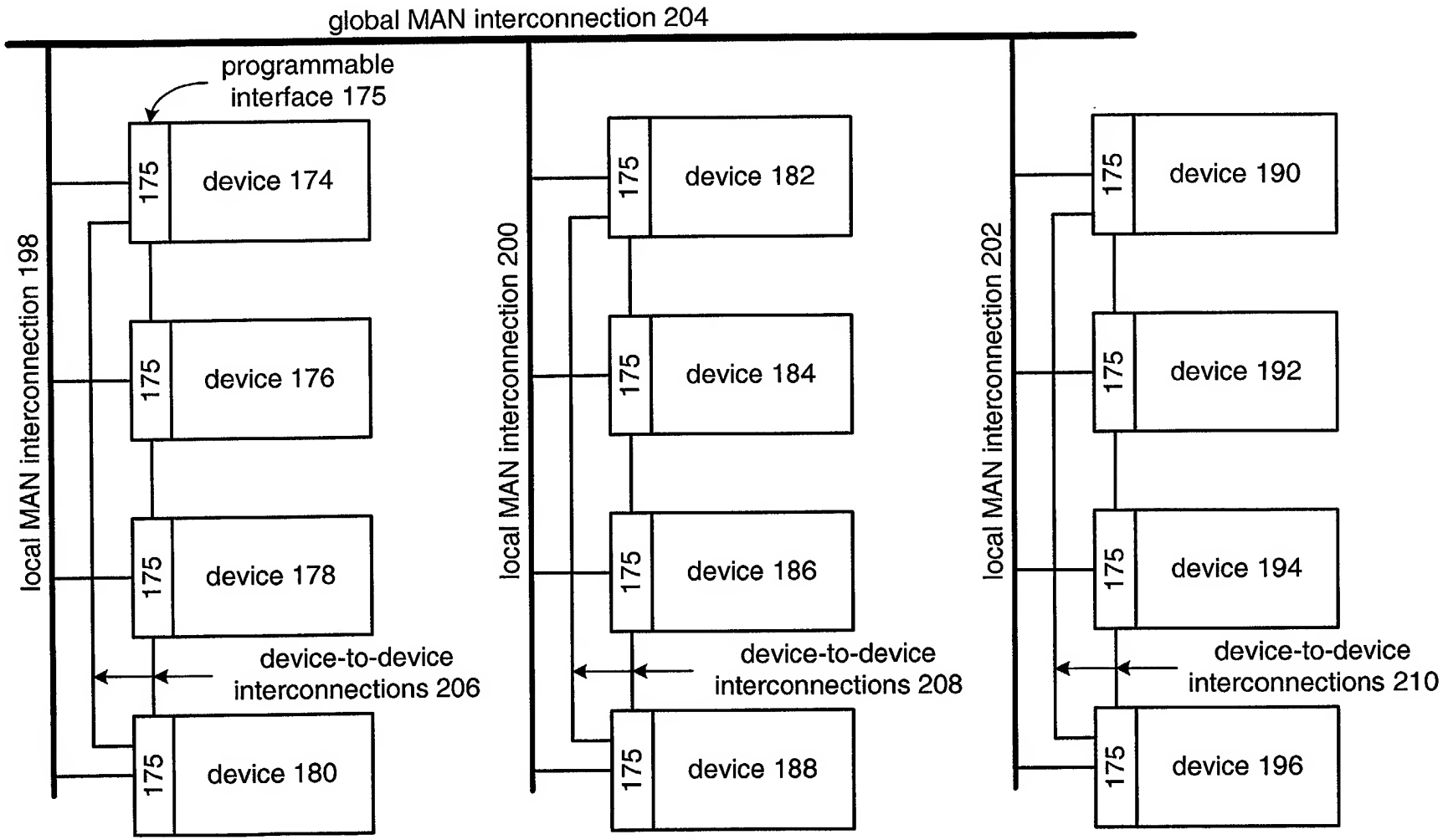

global MAN interconnection 204
programmable interface 175
local MAN interconnection 198
local MAN interconnection 200
local MAN interconnection 202
175
device 174
device 176
device 178
device 180
device 182
device 184
device 186
device 188
device 190
device 192
device 194
device 196
device-to-device interconnections 206
device-to-device interconnections 208
device-to-device interconnections 210

FIG. 6

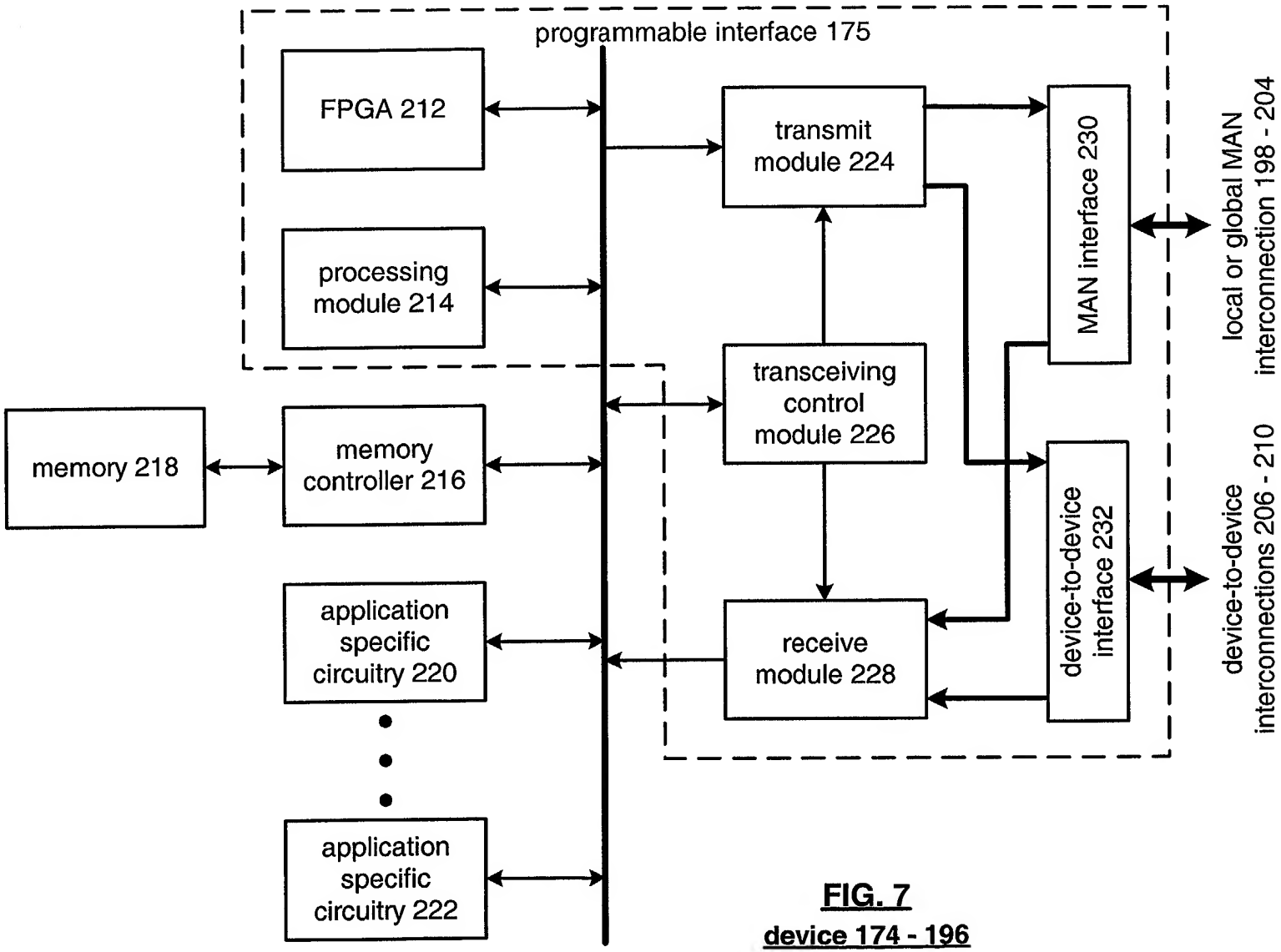


FIG. 7

device 174 - 196

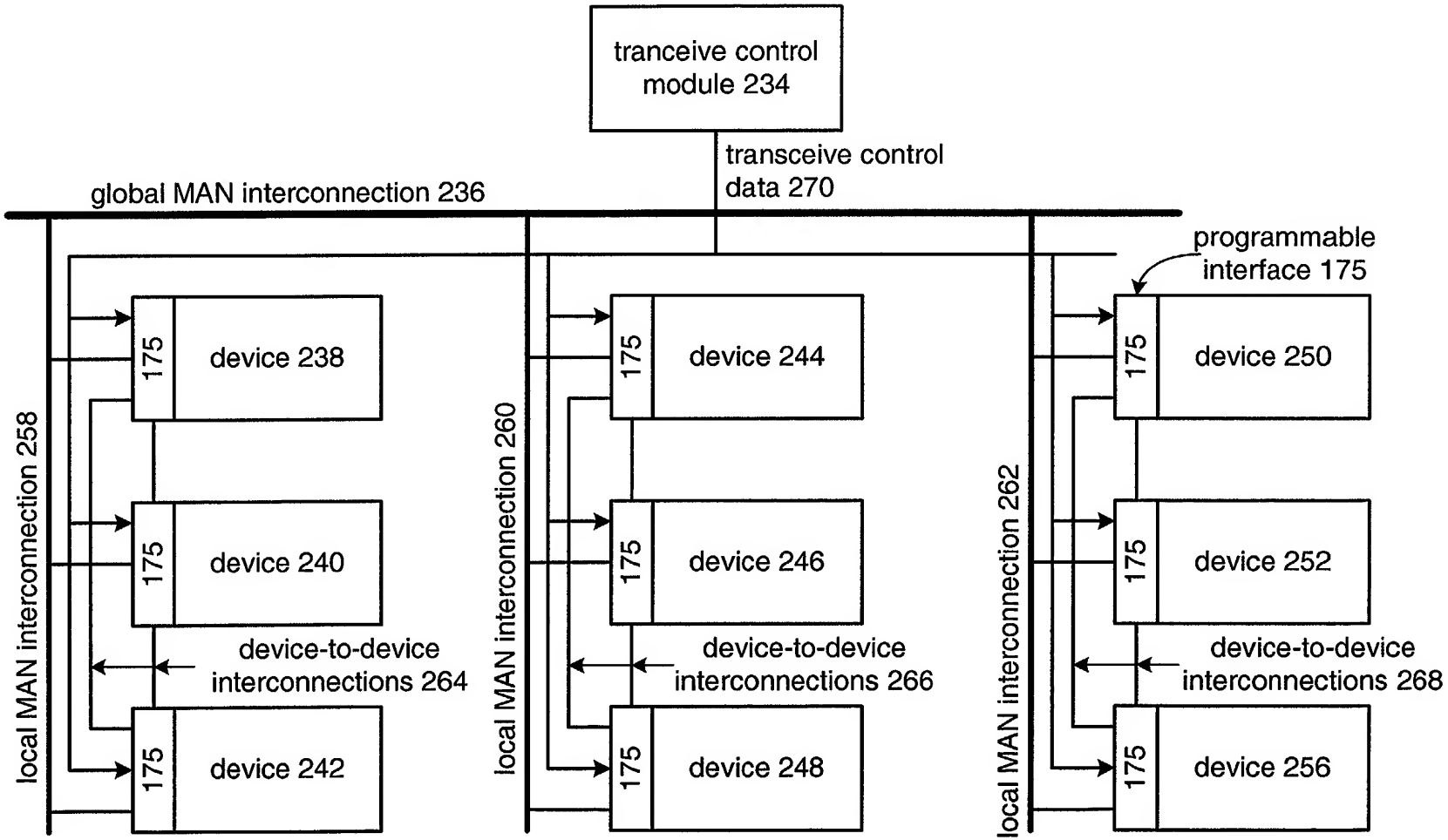

tranceive control module 234
transceive control data 270
global MAN interconnection 236
programmable interface 175
local MAN interconnection 258
local MAN interconnection 260
local MAN interconnection 262
175
device 238
device 240
device 242
device 244
device 246
device 248
device 250
device 252
device 256
device-to-device interconnections 264
device-to-device interconnections 266
device-to-device interconnections 268

FIG. 8

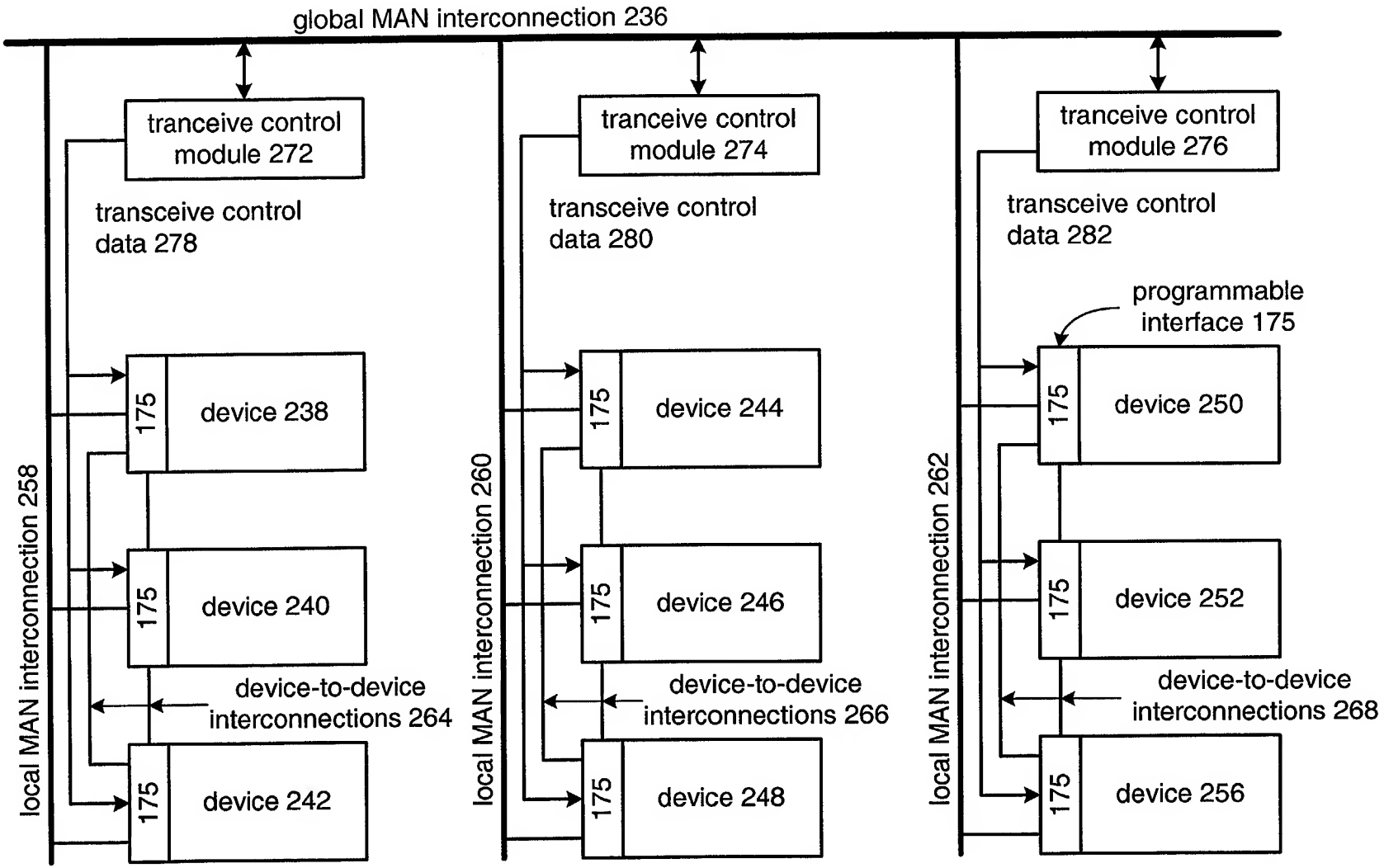

global MAN interconnection 236
tranceive control module 272
transceive control data 278
tranceive control module 274
transceive control data 280
tranceive control module 276
transceive control data 282
programmable interface 175
local MAN interconnection 258
local MAN interconnection 260
local MAN interconnection 262
175
device 238
device 240
device 242
device 244
device 246
device 248
device 250
device 252
device 256
device-to-device interconnections 264
device-to-device interconnections 266
device-to-device interconnections 268

FIG. 9

20nTTO" 89E2hDOT

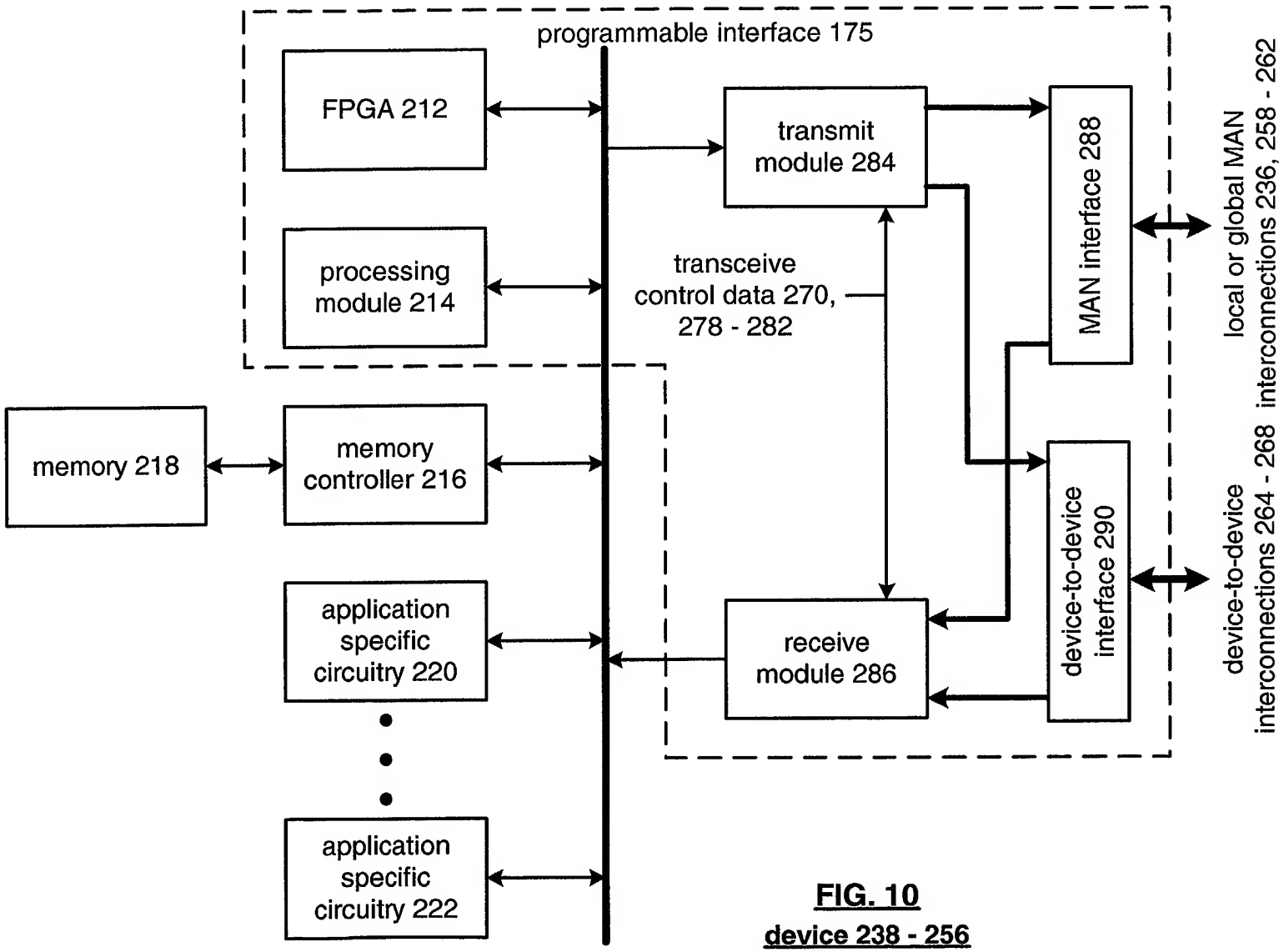


FIG. 10

device 238 - 256

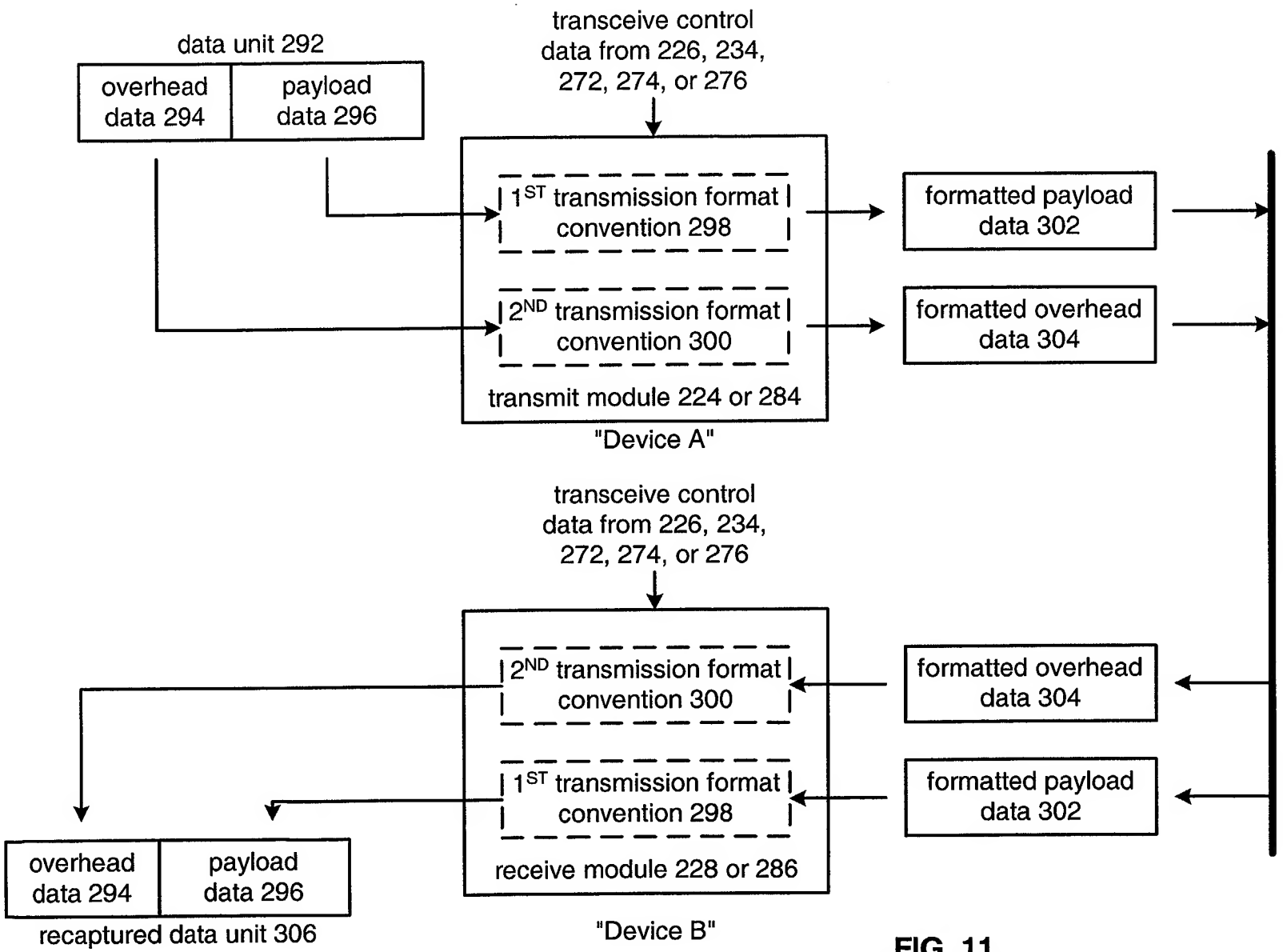
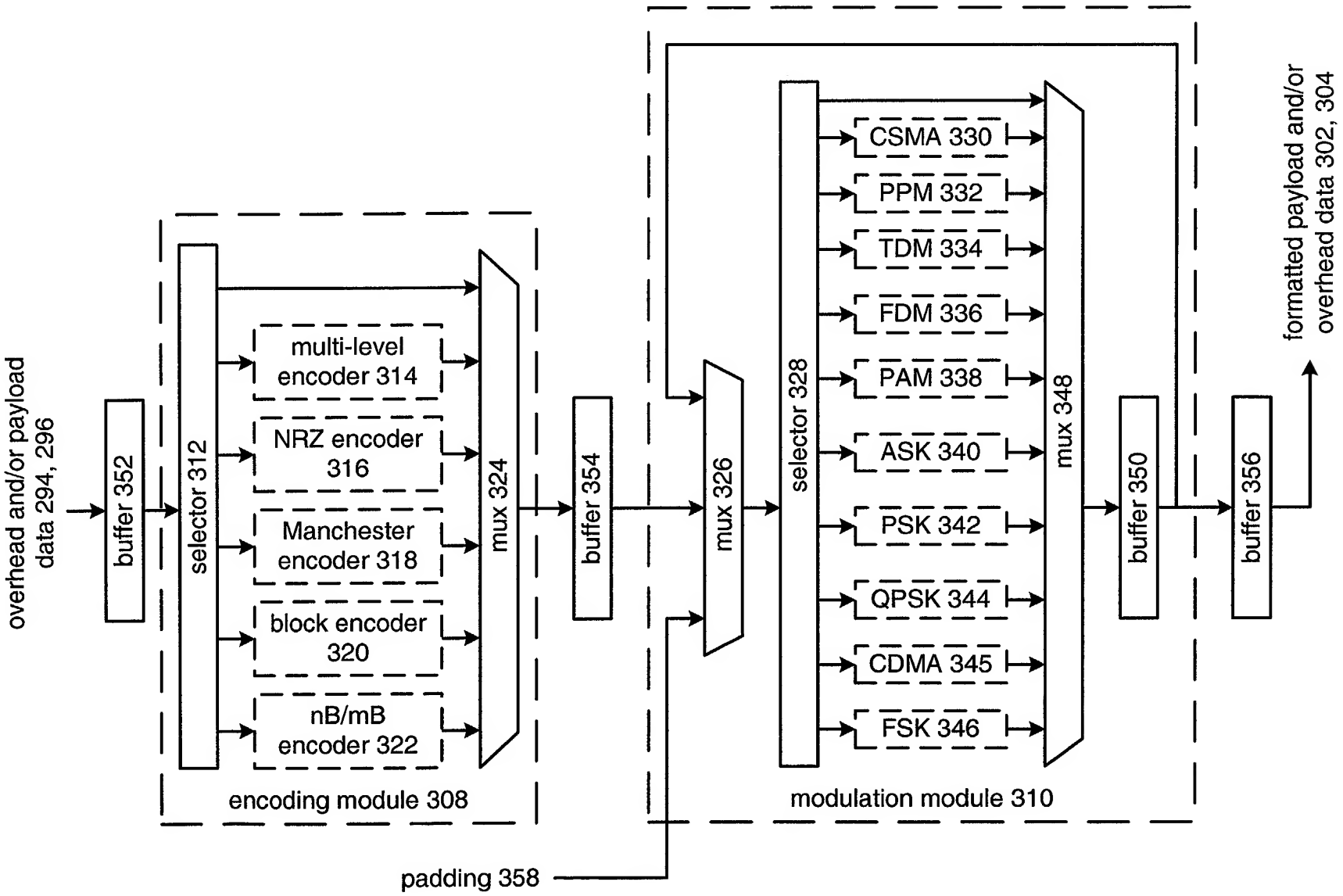
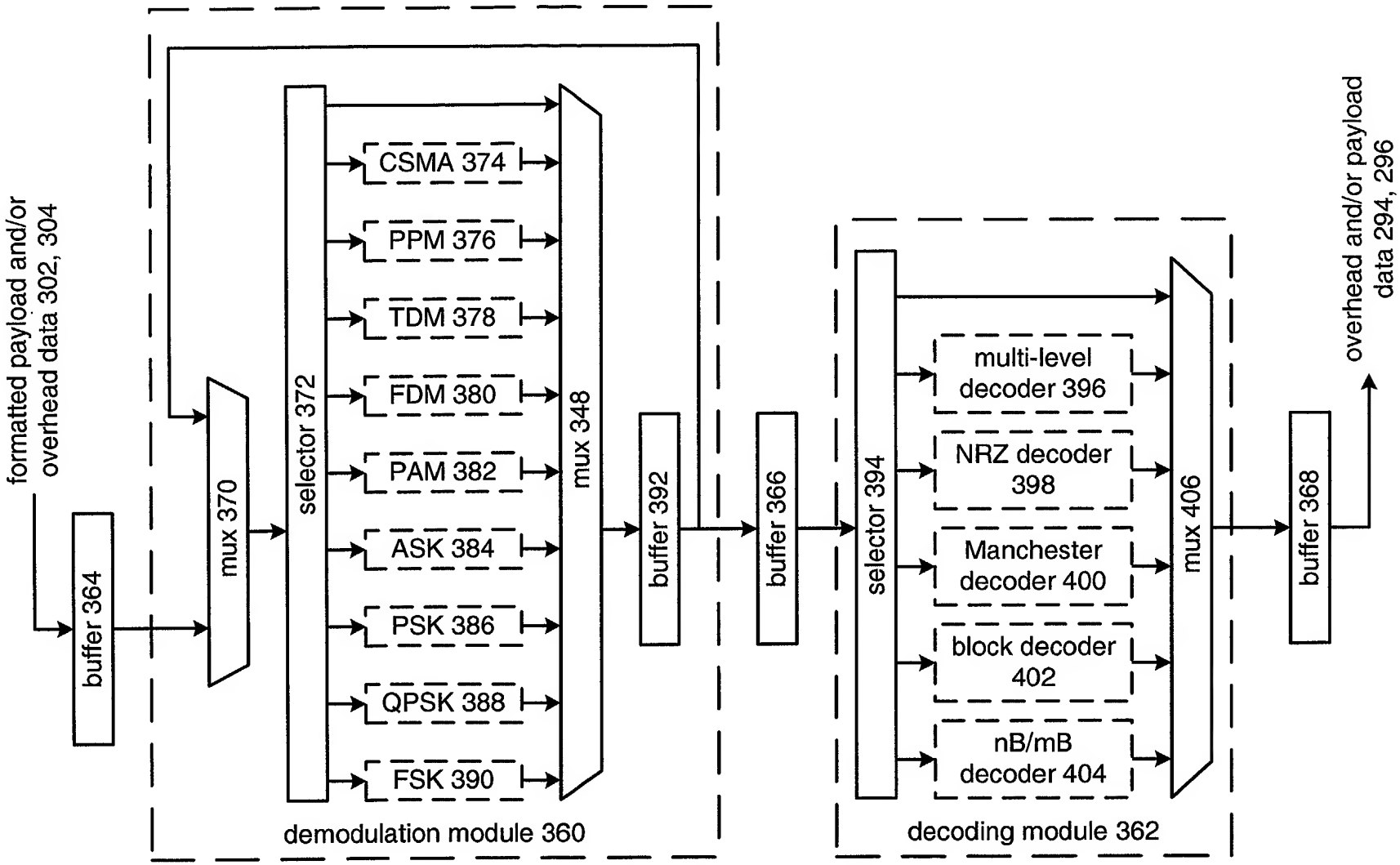

data unit 292
overhead data 294
payload data 296
transceive control data from 226, 234, 272, 274, or 276
1ST transmission format convention 298
2ND transmission format convention 300
transmit module 224 or 284
"Device A"
formatted payload data 302
formatted overhead data 304
transceive control data from 226, 234, 272, 274, or 276
2ND transmission format convention 300
1ST transmission format convention 298
receive module 228 or 286
"Device B"
formatted overhead data 304
formatted payload data 302
overhead data 294
payload data 296
recaptured data unit 306

FIG. 11



transmit module 224 or 284

FIG. 12



receive module 228 or 286

FIG. 13

20nTTO" 89Z4hOOT

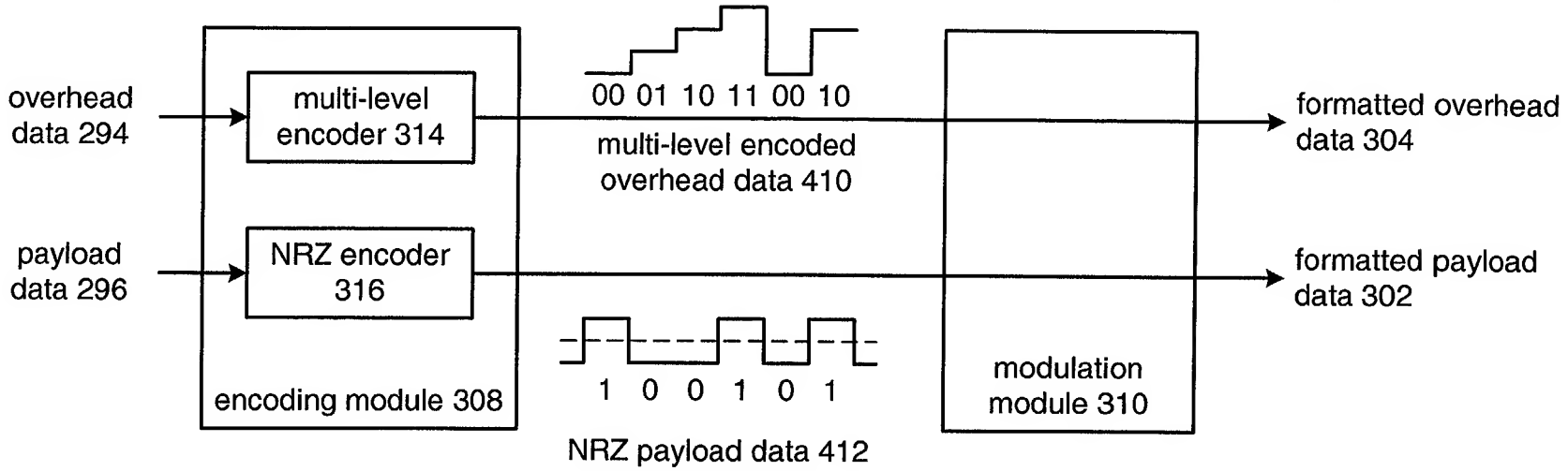


FIG. 14

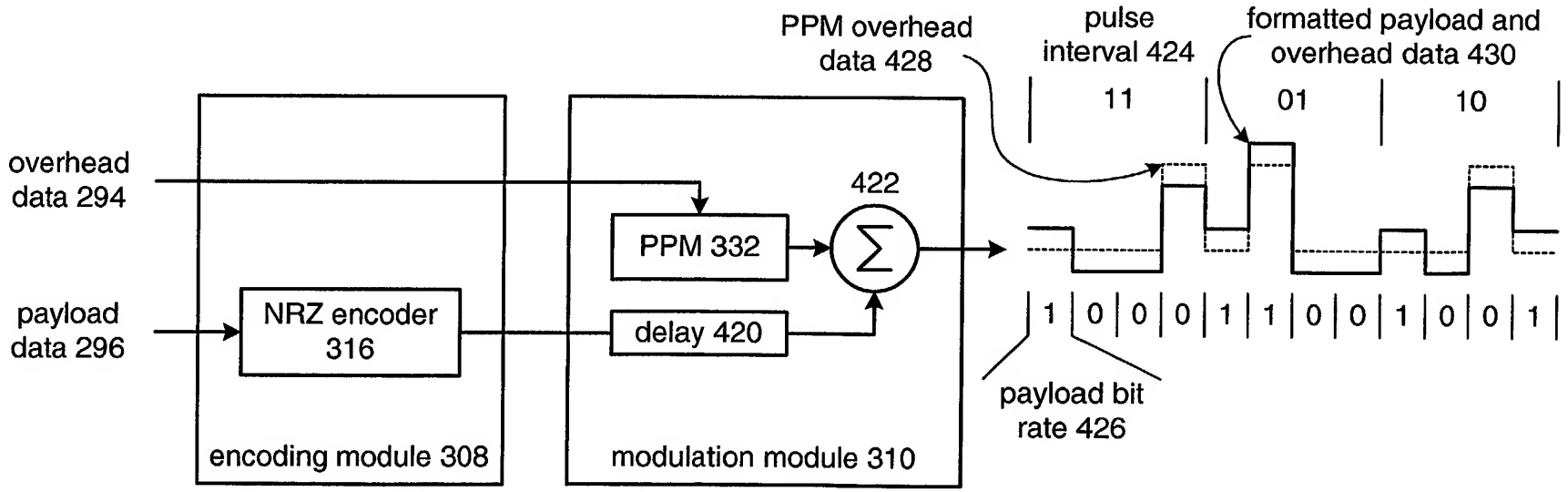


FIG. 15

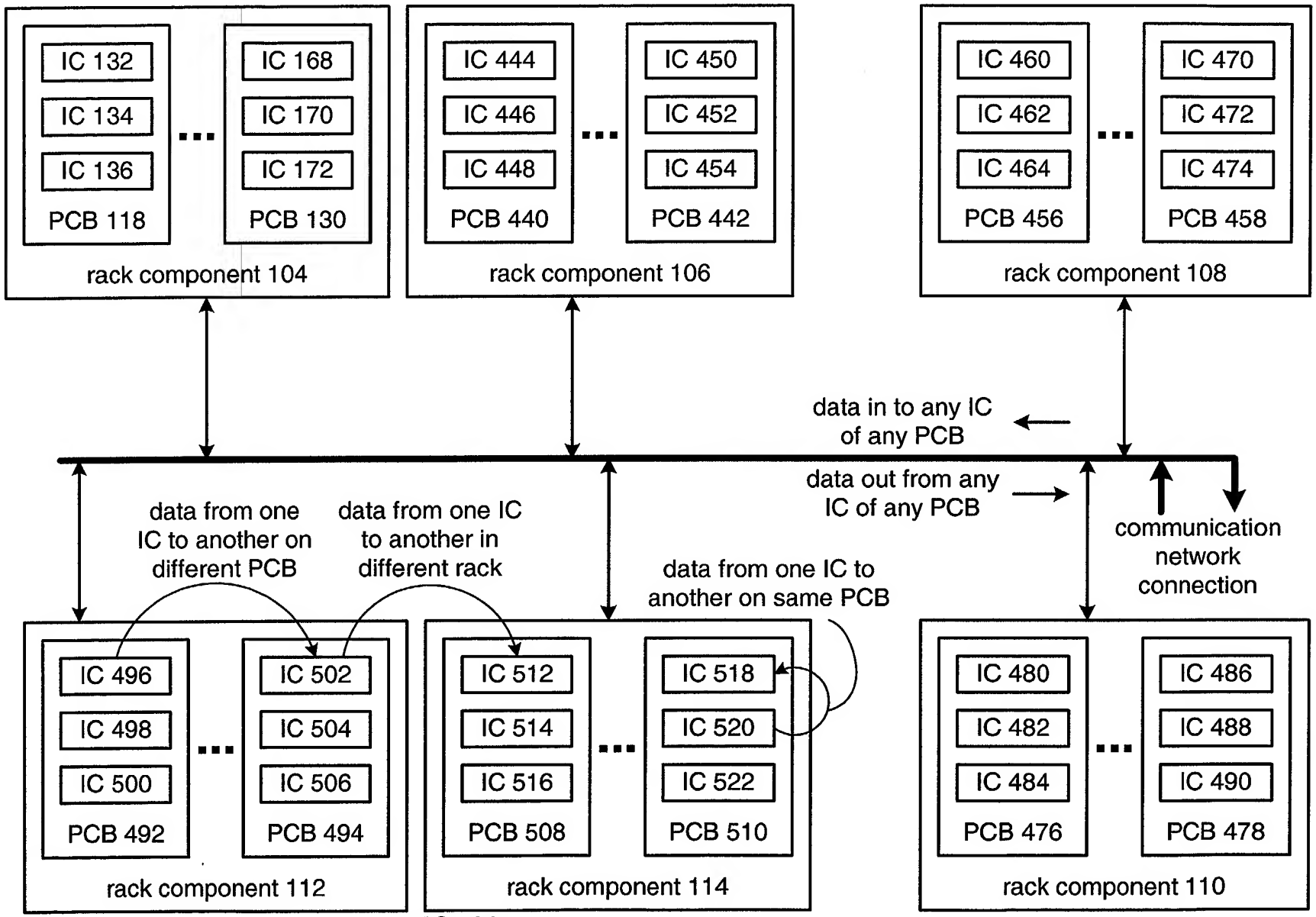

IC 132
IC 134
IC 136
PCB 118
IC 168
IC 170
IC 172
PCB 130
rack component 104
IC 444
IC 446
IC 448
PCB 440
IC 450
IC 452
IC 454
PCB 442
rack component 106
IC 460
IC 462
IC 464
PCB 456
IC 470
IC 472
IC 474
PCB 458
rack component 108
data in to any IC of any PCB
data out from any IC of any PCB
communication network connection
data from one IC to another on different PCB
data from one IC to another in different rack
data from one IC to another on same PCB
IC 496
IC 498
IC 500
PCB 492
IC 502
IC 504
IC 506
PCB 494
rack component 112
IC 512
IC 514
IC 516
PCB 508
IC 518
IC 520
IC 522
PCB 510
rack component 114
IC 480
IC 482
IC 484
PCB 476
IC 486
IC 488
IC 490
PCB 478
rack component 110

FIG. 16

transmission assignments 524		
source	destination	scheme
132-118-104	134-118-104	A
132-118-104	136-118-104	B
132-118-104	x-130-104	C
132-118-104	x-x-106	D
132-118-104	x-x-108	D
132-118-104	x-x-110	E
132-118-104	x-x-112	E
132-118-104	x-x-114	E
⋮	⋮	⋮

FIG. 17

scheme-resource assignment 526		
scheme	resources	encode/mod/S-P
A	1 path	1-0-S
A	2 paths	1-0-P
A	1-OH, 1-PL	2-1-S
⋮	⋮	⋮
B	1 path	2-0-S

FIG. 18

encoding-modulation-serial/parallel table 528					
encode/mod/S-P	OH encoding	payload encoding	OH modulation	payload mod	Serial/Parallel
1-0-S	multi-level	NRZ	none	none	S-Tx of OH and PL
1-0-P	multi-level	NRZ	none	none	P-Tx of OH and PL
2-1-S	multi-level	nB/mB	none	none	OH:path1; PL:path2
0-1-S	none	NRZ	PPM	mix	S-Tx of OH and PL
⋮	⋮	⋮	⋮	⋮	⋮

FIG. 19

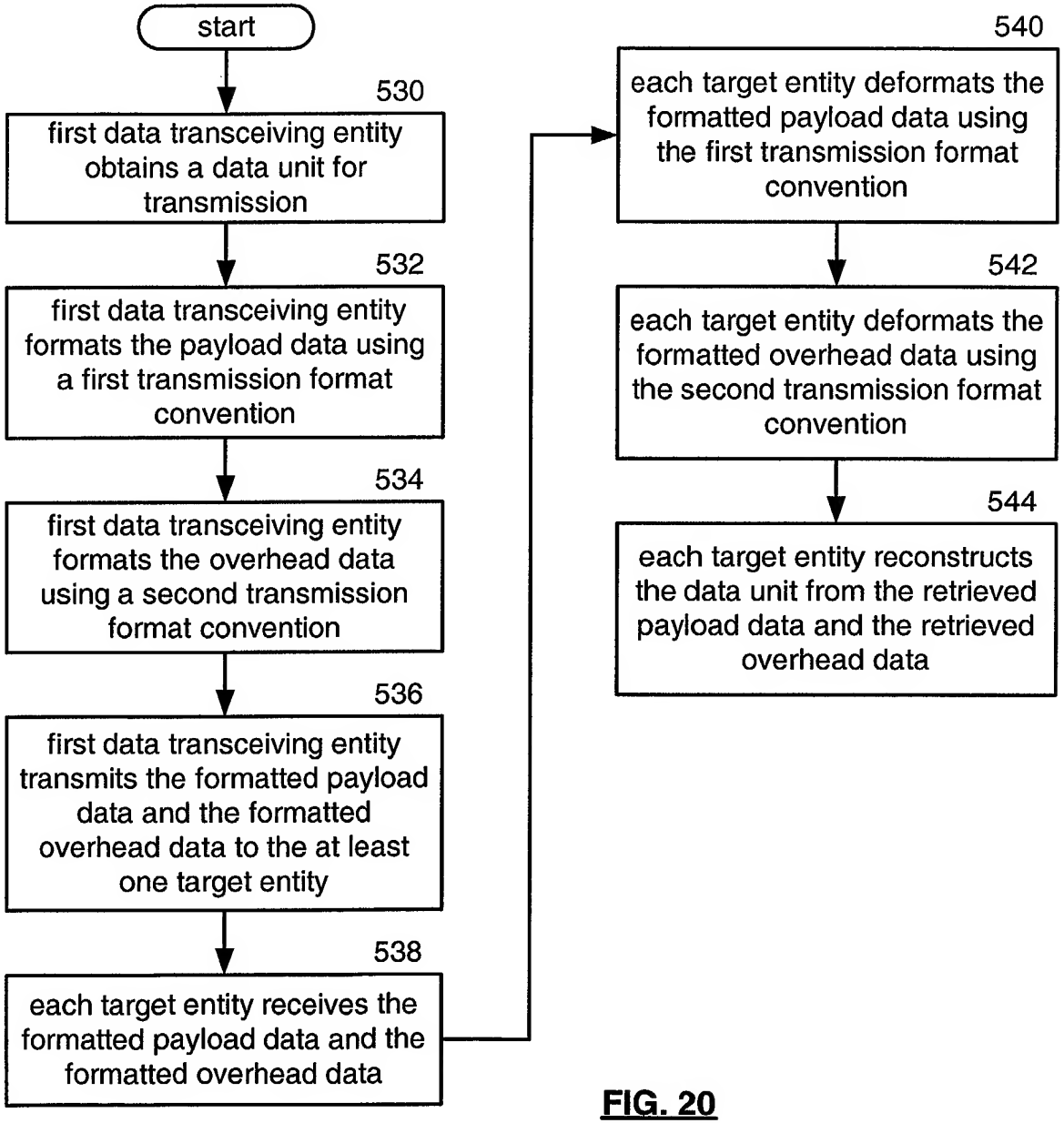

start
530
first data transceiving entity obtains a data unit for transmission
532
first data transceiving entity formats the payload data using a first transmission format convention
534
first data transceiving entity formats the overhead data using a second transmission format convention
536
first data transceiving entity transmits the formatted payload data and the formatted overhead data to the at least one target entity
538
each target entity receives the formatted payload data and the formatted overhead data
540
each target entity deformats the formatted payload data using the first transmission format convention
542
each target entity deformats the formatted overhead data using the second transmission format convention
544
each target entity reconstructs the data unit from the retrieved payload data and the retrieved overhead data

FIG. 20

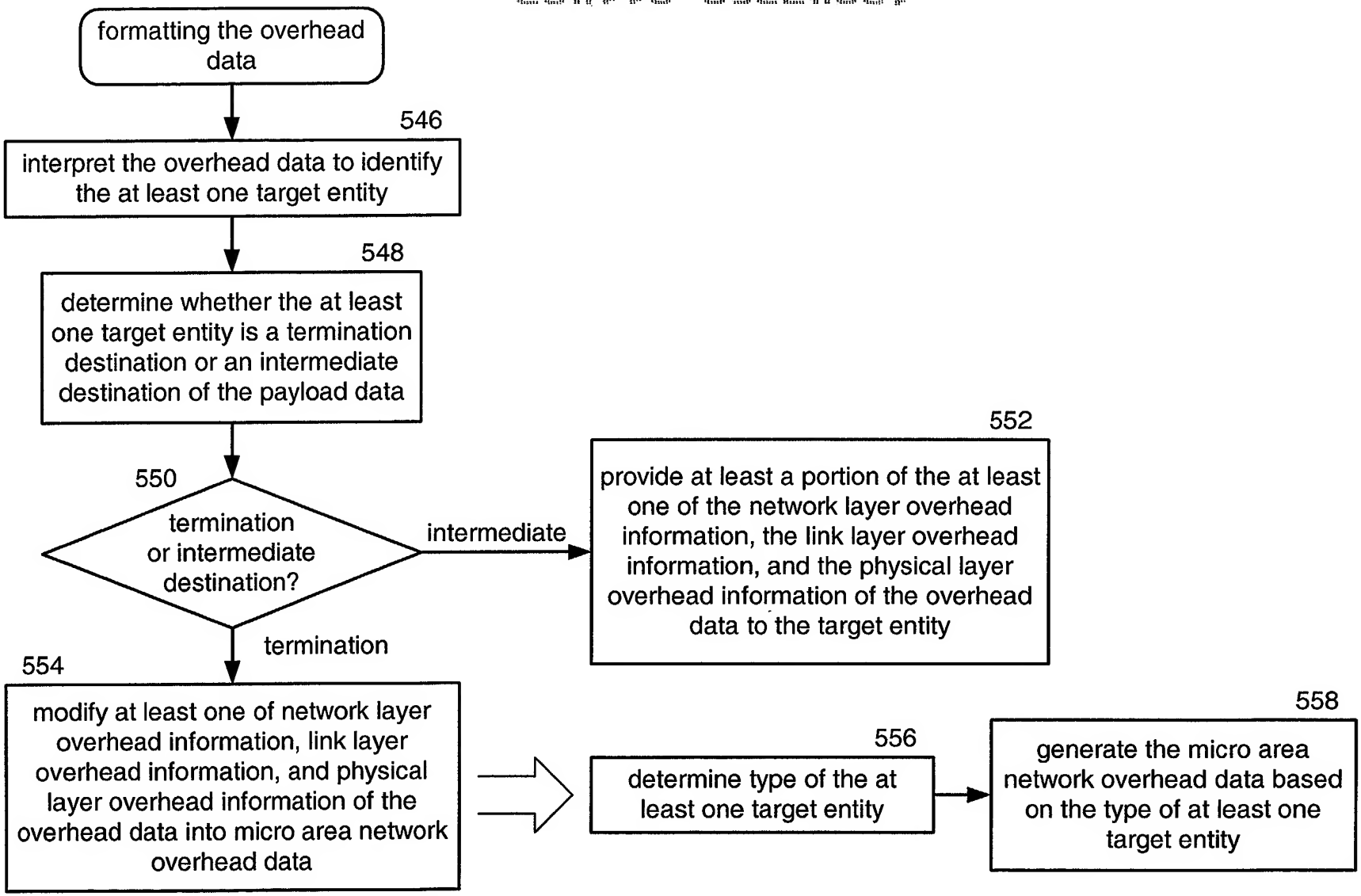

formatting the overhead data
546
interpret the overhead data to identify the at least one target entity
548
determine whether the at least one target entity is a termination destination or an intermediate destination of the payload data
550
termination or intermediate destination?
intermediate
552
provide at least a portion of the at least one of the network layer overhead information, the link layer overhead information, and the physical layer overhead information of the overhead data to the target entity
termination
554
modify at least one of network layer overhead information, link layer overhead information, and physical layer overhead information of the overhead data into micro area network overhead data
556
determine type of the at least one target entity
558
generate the micro area network overhead data based on the type of at least one target entity

FIG. 21

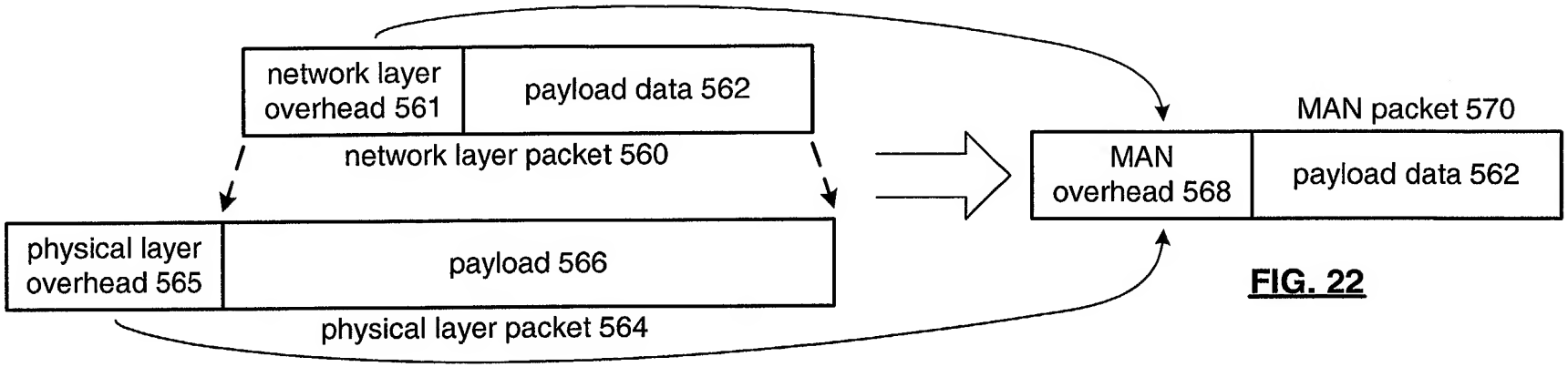

network layer overhead 561
payload data 562
network layer packet 560
physical layer overhead 565
payload 566
physical layer packet 564
MAN packet 570
MAN overhead 568
payload data 562

FIG. 22

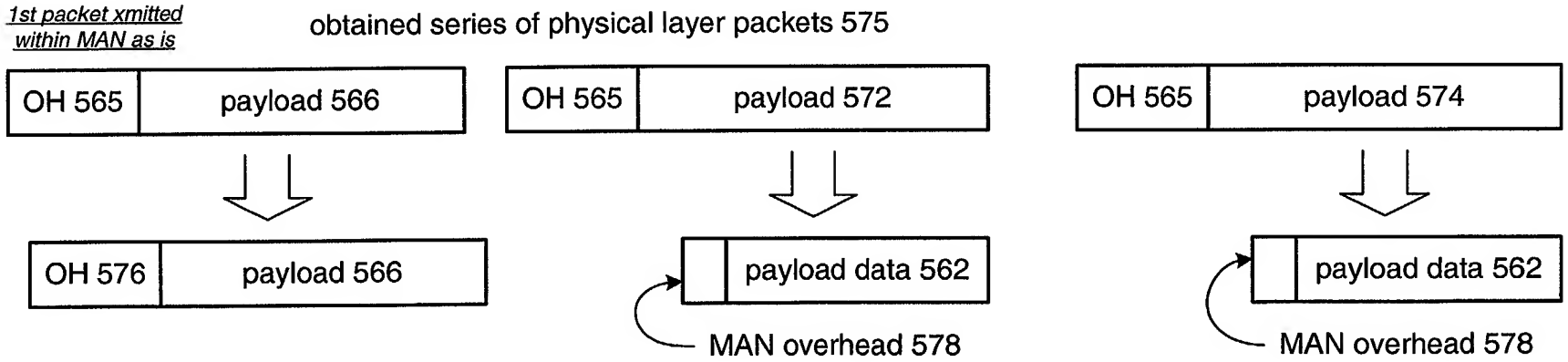

1st packet xmitted within MAN as is
obtained series of physical layer packets 575
OH 565
payload 566
OH 576
payload 566
OH 565
payload 572
payload data 562
MAN overhead 578
OH 565
payload 574
payload data 562
MAN overhead 578

FIG. 23

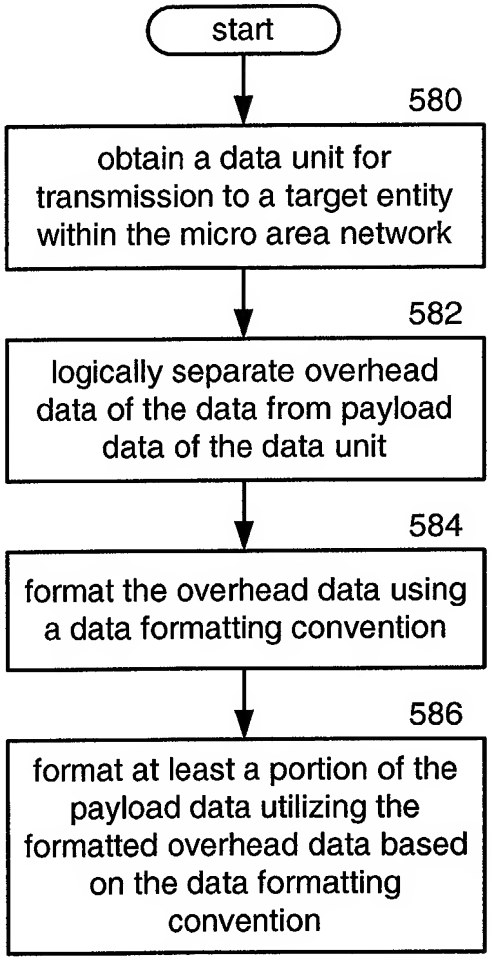

start
580
obtain a data unit for transmission to a target entity within the micro area network
582
logically separate overhead data of the data from payload data of the data unit
584
format the overhead data using a data formatting convention
586
format at least a portion of the payload data utilizing the formatted overhead data based on the data formatting convention

FIG. 24

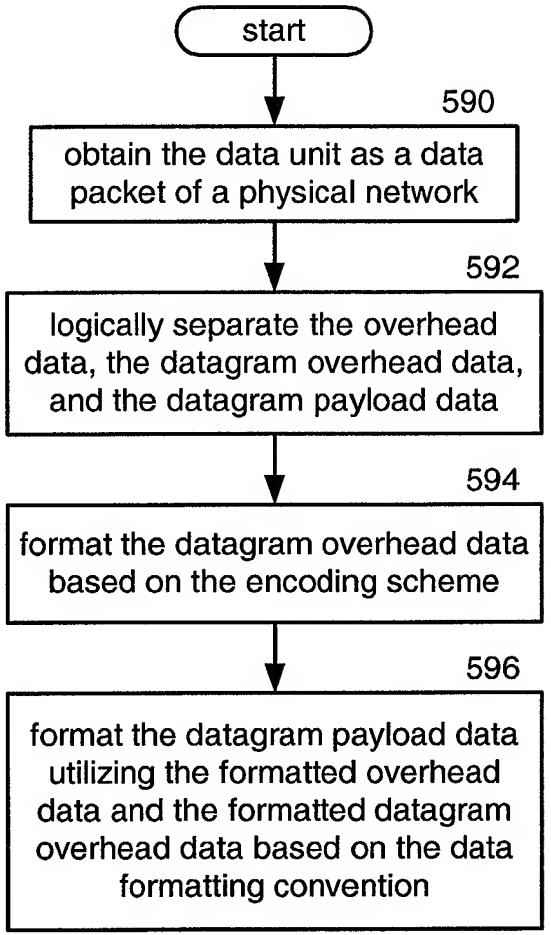

start
590
obtain the data unit as a data packet of a physical network
592
logically separate the overhead data, the datagram overhead data, and the datagram payload data
594
format the datagram overhead data based on the encoding scheme
596
format the datagram payload data utilizing the formatted overhead data and the formatted datagram overhead data based on the data formatting convention

FIG. 25

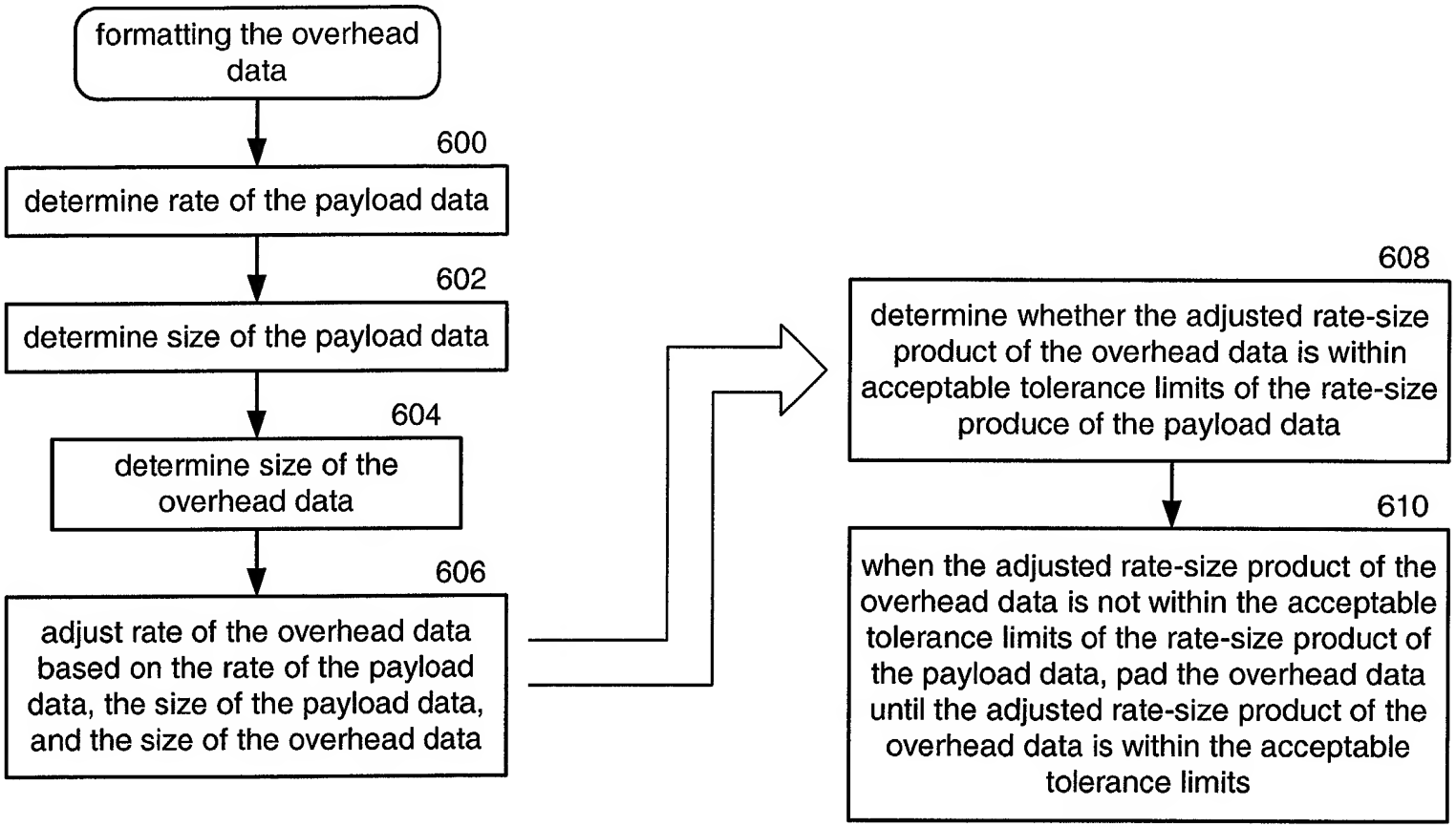

formatting the overhead data
600
determine rate of the payload data
602
determine size of the payload data
604
determine size of the overhead data
606
adjust rate of the overhead data based on the rate of the payload data, the size of the payload data, and the size of the overhead data
608
determine whether the adjusted rate-size product of the overhead data is within acceptable tolerance limits of the rate-size produce of the payload data
610
when the adjusted rate-size product of the overhead data is not within the acceptable tolerance limits of the rate-size product of the payload data, pad the overhead data until the adjusted rate-size product of the overhead data is within the acceptable tolerance limits

FIG. 26

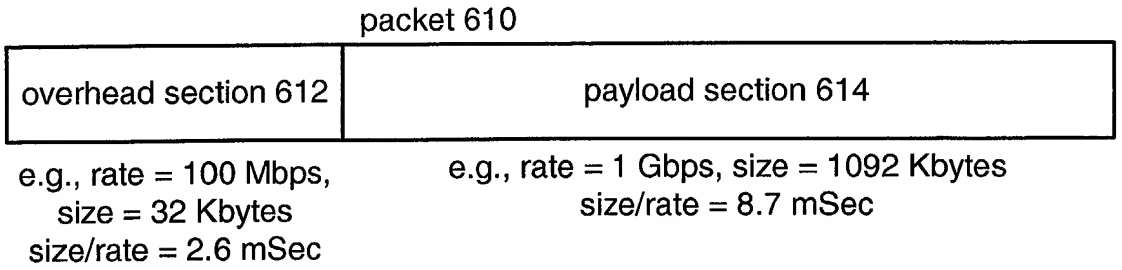


FIG. 27

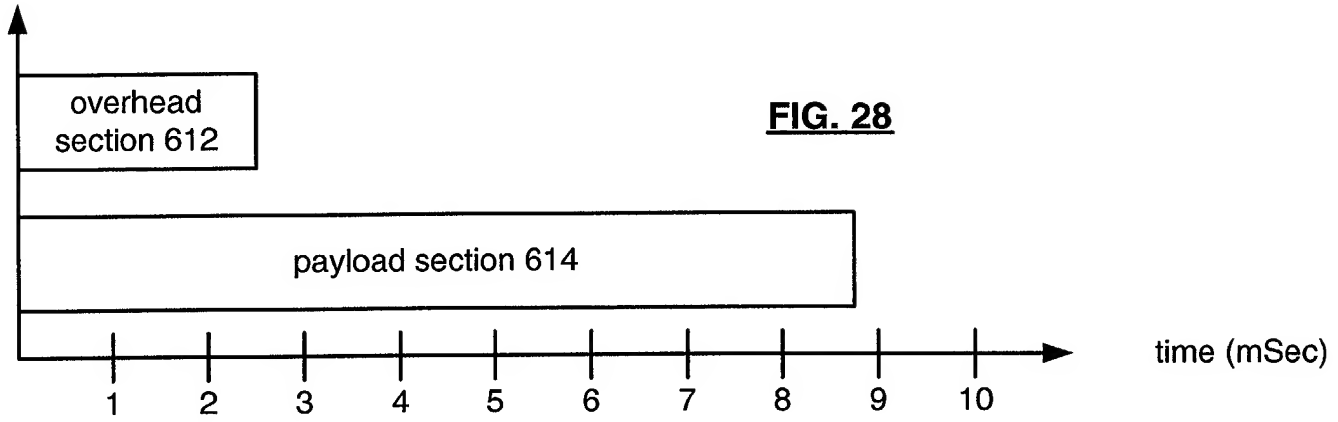


FIG. 28

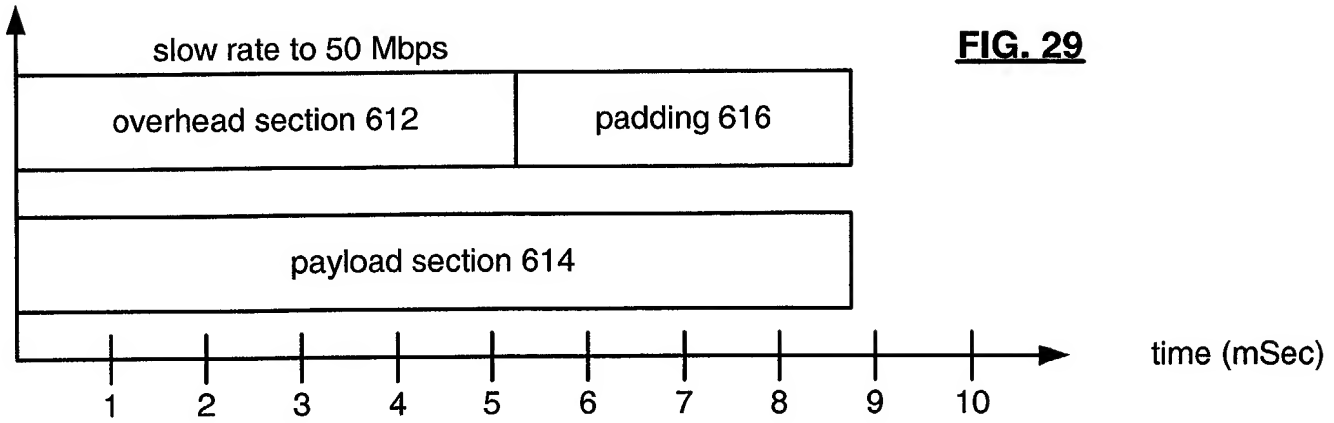


FIG. 29

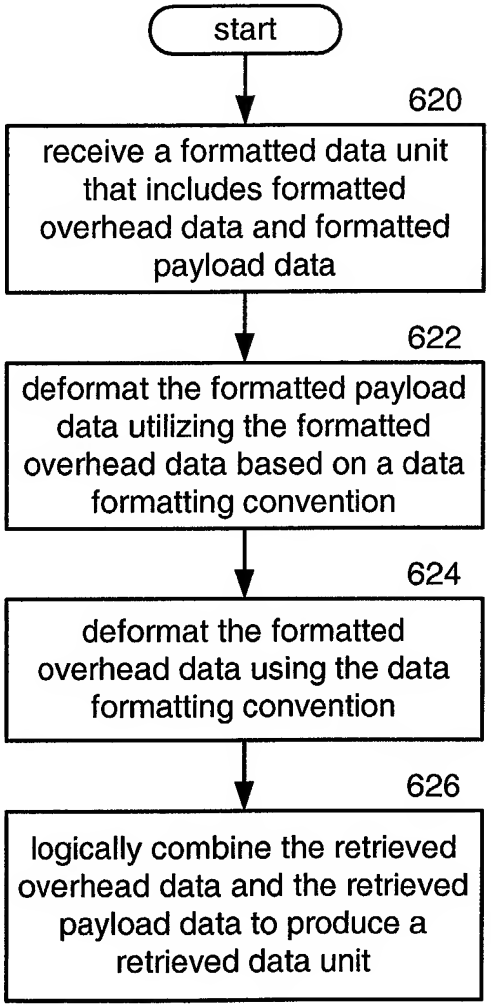

start
620
receive a formatted data unit that includes formatted overhead data and formatted payload data
622
deformat the formatted payload data utilizing the formatted overhead data based on a data formatting convention
624
deformat the formatted overhead data using the data formatting convention
626
logically combine the retrieved overhead data and the retrieved payload data to produce a retrieved data unit

FIG. 30

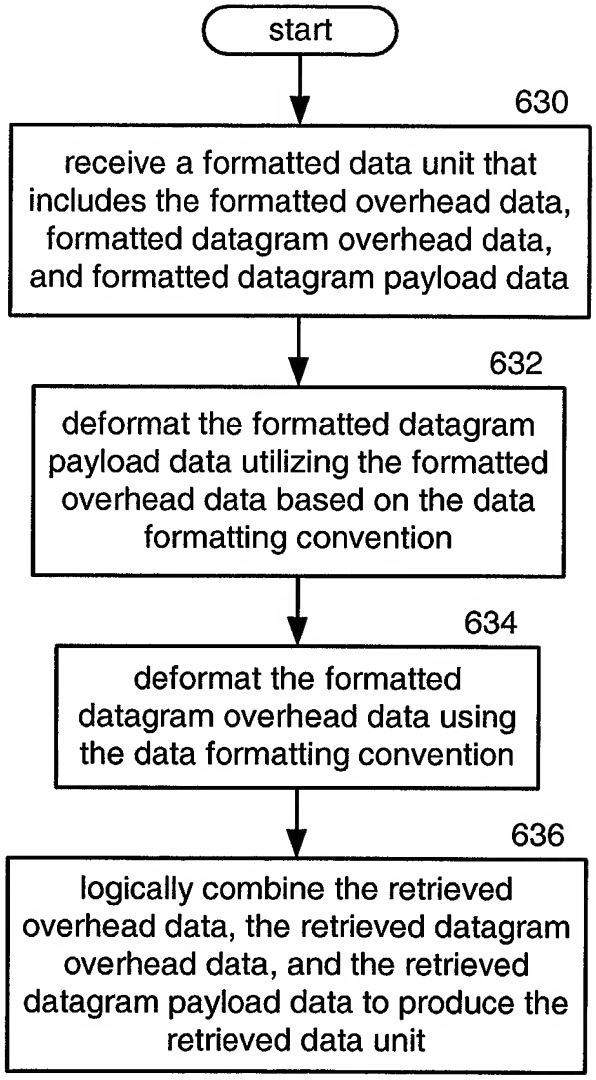

start
630
receive a formatted data unit that includes the formatted overhead data, formatted datagram overhead data, and formatted datagram payload data
632
deformat the formatted datagram payload data utilizing the formatted overhead data based on the data formatting convention
634
deformat the formatted datagram overhead data using the data formatting convention
636
logically combine the retrieved overhead data, the retrieved datagram overhead data, and the retrieved datagram payload data to produce the retrieved data unit

FIG. 31

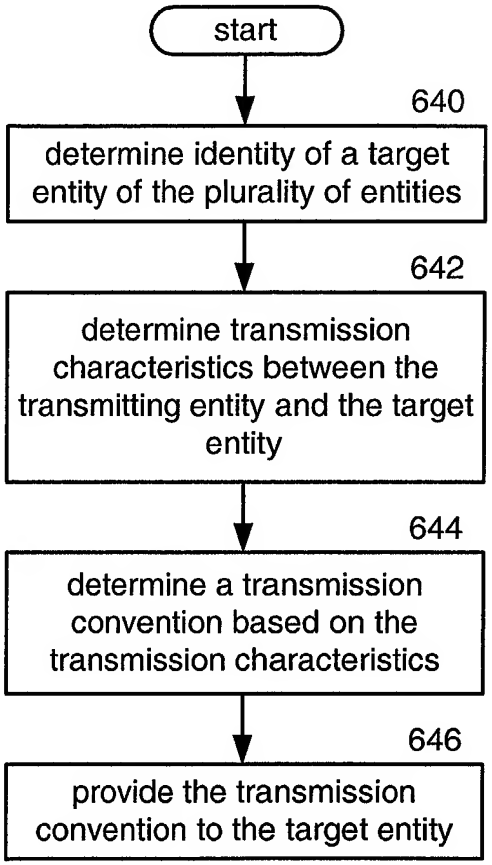

start
640
determine identity of a target entity of the plurality of entities
642
determine transmission characteristics between the transmitting entity and the target entity
644
determine a transmission convention based on the transmission characteristics
646
provide the transmission convention to the target entity

FIG. 32

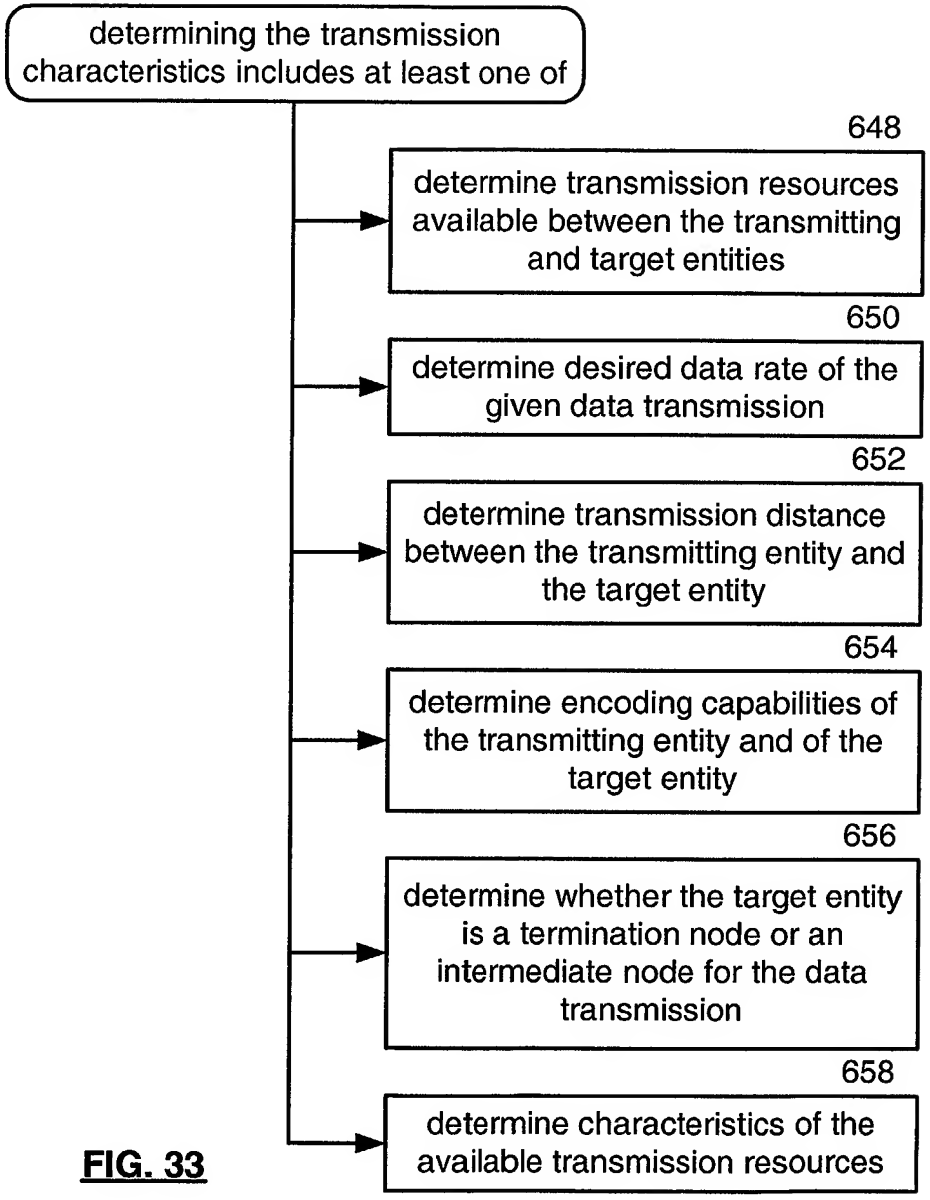

determining the transmission characteristics includes at least one of
648
determine transmission resources available between the transmitting and target entities
650
determine desired data rate of the given data transmission
652
determine transmission distance between the transmitting entity and the target entity
654
determine encoding capabilities of the transmitting entity and of the target entity
656
determine whether the target entity is a termination node or an intermediate node for the data transmission
658
determine characteristics of the available transmission resources

FIG. 33

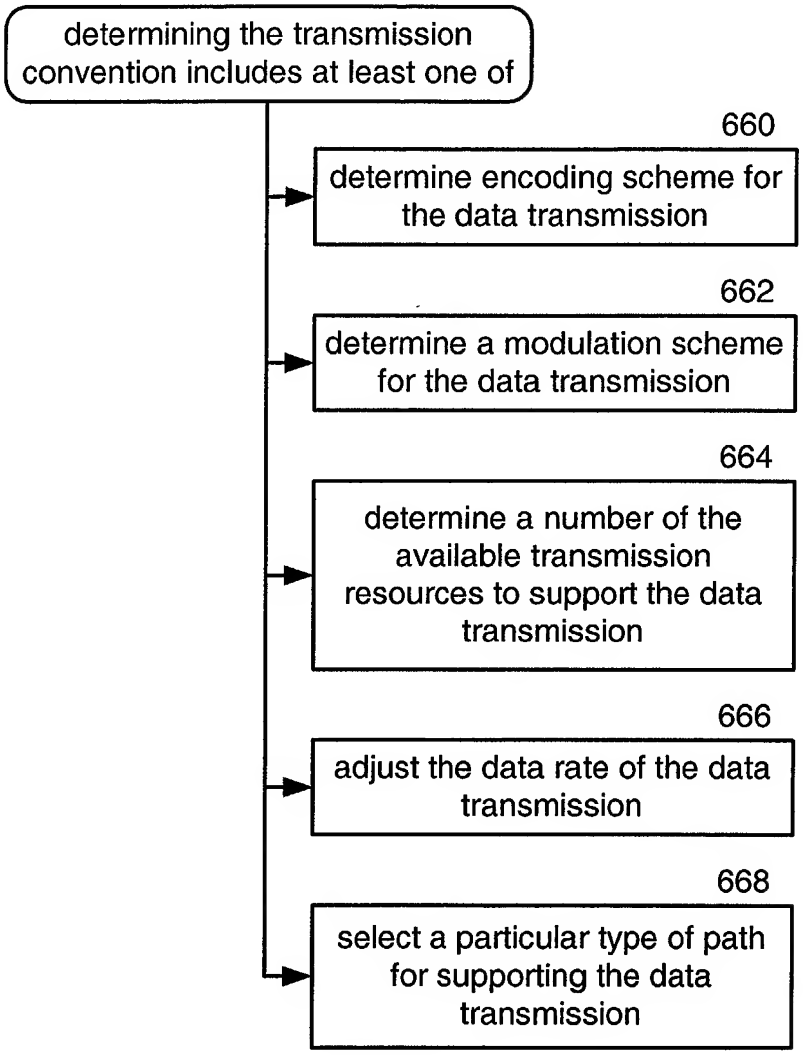

determining the transmission convention includes at least one of
660
determine encoding scheme for the data transmission
662
determine a modulation scheme for the data transmission
664
determine a number of the available transmission resources to support the data transmission
666
adjust the data rate of the data transmission
668
select a particular type of path for supporting the data transmission

FIG. 34

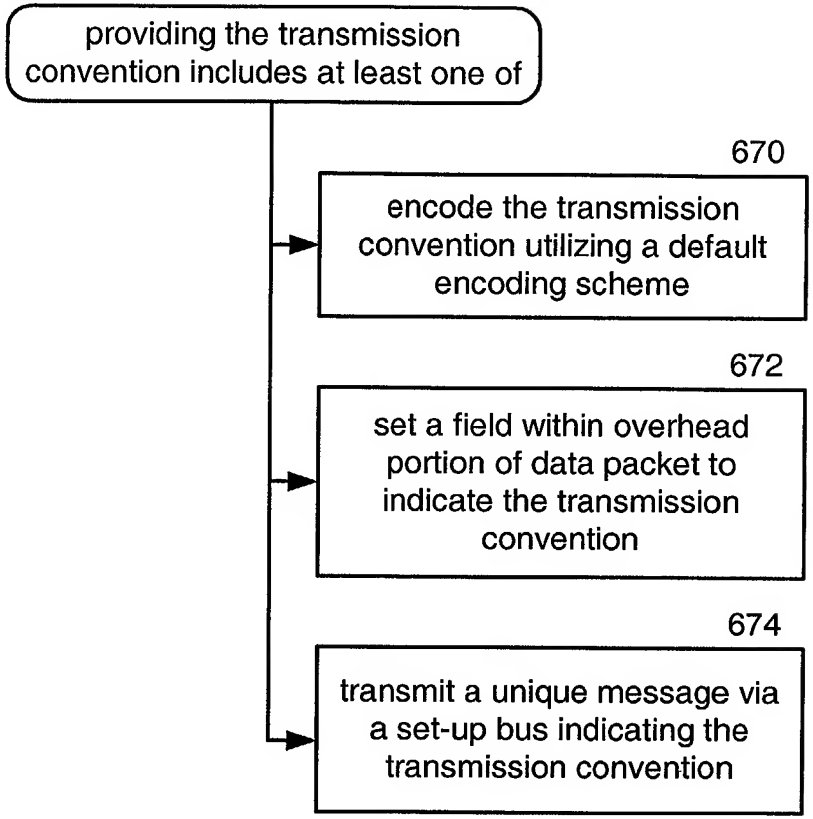

providing the transmission convention includes at least one of
670
encode the transmission convention utilizing a default encoding scheme
672
set a field within overhead portion of data packet to indicate the transmission convention
674
transmit a unique message via a set-up bus indicating the transmission convention

FIG. 35

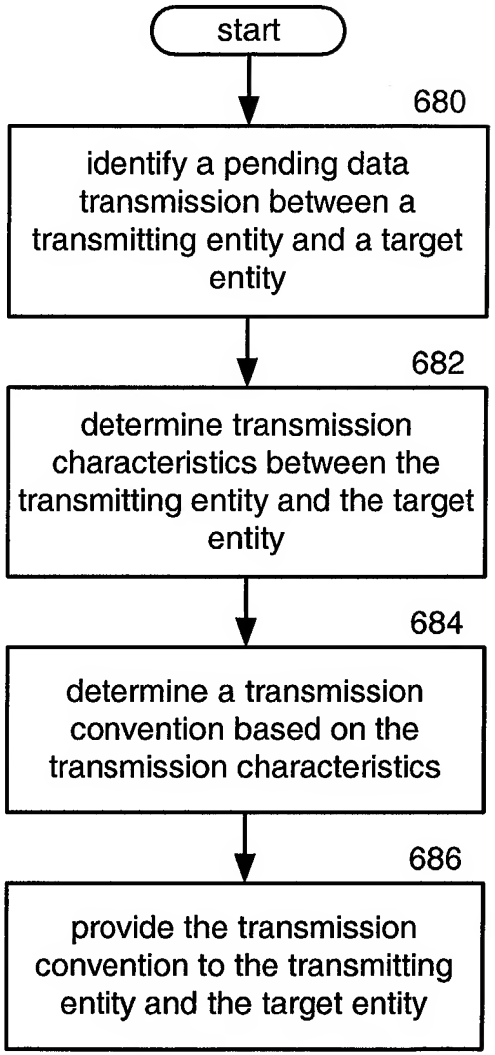

start
680
identify a pending data transmission between a transmitting entity and a target entity
682
determine transmission characteristics between the transmitting entity and the target entity
684
determine a transmission convention based on the transmission characteristics
686
provide the transmission convention to the transmitting entity and the target entity

FIG. 36

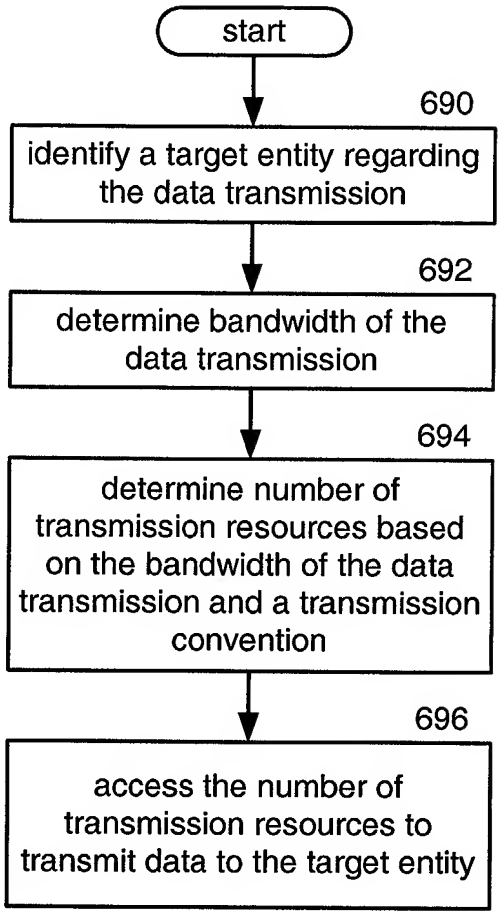

start
690
identify a target entity regarding the data transmission
692
determine bandwidth of the data transmission
694
determine number of transmission resources based on the bandwidth of the data transmission and a transmission convention
696
access the number of transmission resources to transmit data to the target entity

FIG. 37

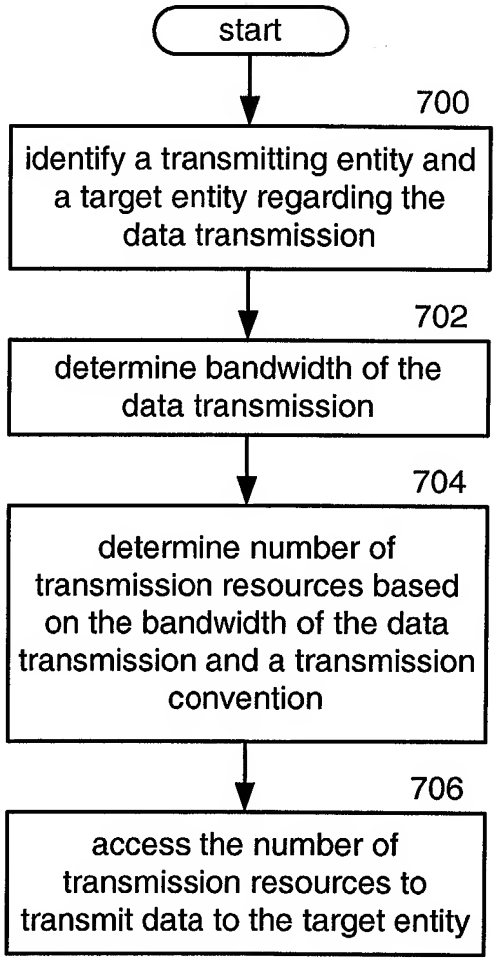

start
700
identify a transmitting entity and a target entity regarding the data transmission
702
determine bandwidth of the data transmission
704
determine number of transmission resources based on the bandwidth of the data transmission and a transmission convention
706
access the number of transmission resources to transmit data to the target entity

FIG. 38

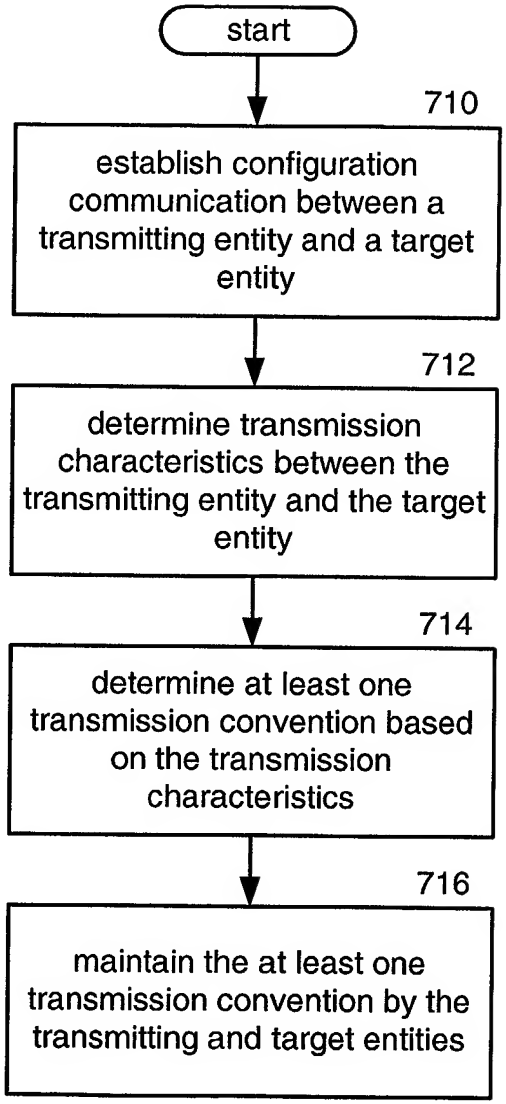

start
710
establish configuration communication between a transmitting entity and a target entity
712
determine transmission characteristics between the transmitting entity and the target entity
714
determine at least one transmission convention based on the transmission characteristics
716
maintain the at least one transmission convention by the transmitting and target entities

FIG. 39

20mTO" 89E2h00T

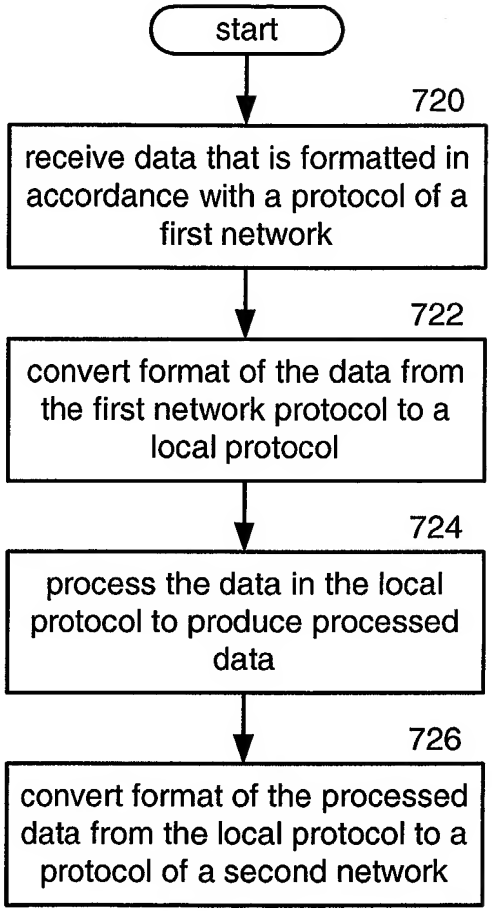


FIG. 40

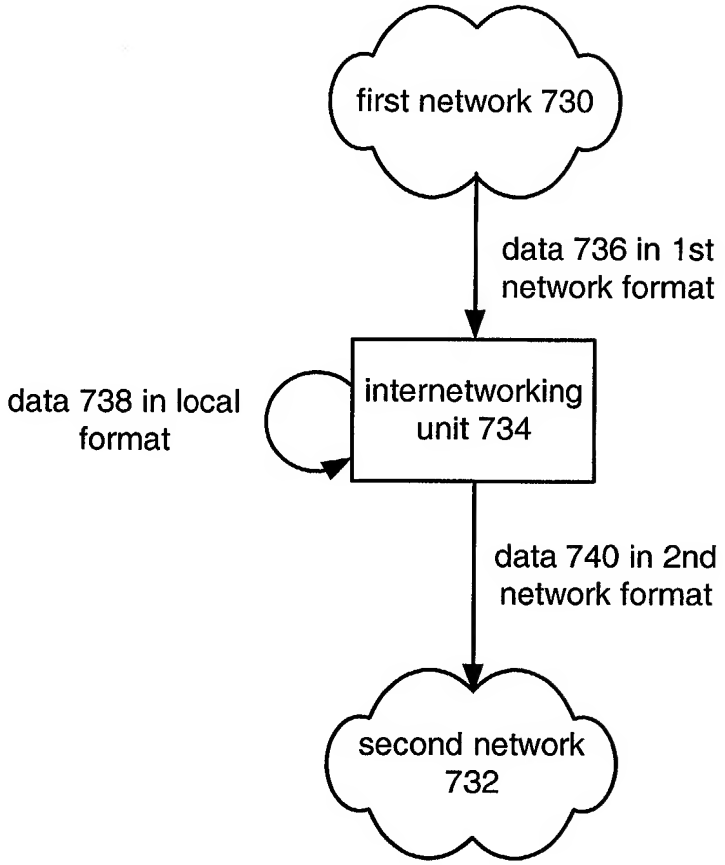


FIG. 41